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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WANG, GEORGE Y

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 02 28 2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/014,393

Applicant(s)

RAO ET AL.

Examiner

George Y. Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 9-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 32-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-8 and 32-34, drawn to an optical modulator apparatus and method of use, classified in class 385, subclass 1.
 - II. Claims 9-18, drawn to a polarization-multiplexed modulator, classified in class 359, subclass 140.
 - III. Claims 19-31, drawn to a polarization-multiplexed modulator, classified in class 359, subclass 138.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and (II & III) are related as process and apparatus for its practice.

The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the polarization-multiplexed modulator of Group II and III do not require the particulars of the Group I method. The components of Inventions II and III call upon other possible functions other than modulating an optical clock signal, such as time division and optical switching.

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are

shown to be separately usable. In the instant case, invention II has separate utility such as in time division requiring a planar birefringent medium as opposed to invention III's multiplexing function. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II and III, restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Kurt Rauschenbach on 07 February 2003 a provisional election was made without traverse to prosecute the invention of the optical modulator method and apparatus, claims 1-8 and 32-34. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-31 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-8 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (U.S. Patent No. 6,486,990, from hereinafter "Roberts") in view of Cao et al. (U.S. Patent No. 6,148,122, from hereinafter "Cao").

7. Regarding claims 1 and 32-33, Roberts discloses a method and means for modulating a polarization-multiplexed optical clock signal for an optical communication system that includes splitting (fig. 3, ref. 42) a linearly polarized input clock signal (fig. 3, ref. 40) into first and second polarizations, delaying (fig. 3, ref. 56, 58) the first signal

relative to the second, and rotating (fig. 3, ref. 46; fig. 12, ref. 200) and combining the signals (fig. 3, ref. 50)

Although the reference teaches the modulation (fig. 3, ref. 44) of the polarization-multiplexed signal with a polarization-insensitive optical modulator to encode data (fig. 3, ref. 48) on the optical clock signal, Roberts fails to disclose this as a step after the optical clock signal combination. Furthermore, Roberts fails to disclose a polarization-insensitive modulator.

Cao discloses a polarization-insensitive modulator (title; col. 1, lines 16-20).

It would have been obvious to one of ordinary skill in the art to modulate the polarized-multiplexed optical clock signal with a polarization-insensitive modulator since one would be motivated to increase transmission speed and capacity in communication applications such as optical regenerators (col. 1, lines 16-20). Furthermore, one of ordinary skill in the art at the time the invention was made would have modulated the polarization-multiplexed signal with a polarization-insensitive optical modulator to encode data after the optical clock signal combination since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. In addition, one of ordinary skill in the art would recognize that this arrangement would be functionally equivalent since they serve the same function and purpose of encoding data on the signal.

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8. As to claim 2, Roberts discloses the modulation method as recited above, however, the reference fails to specifically disclose that the first polarization state is orthogonal to the second polarization state.

Cao teaches optical modulation where the first polarization state is orthogonal to the second polarization state (col. 6, lines 43-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first polarization state is orthogonal to the second polarization state since one would be motivated to allow for full compensation for birefringence (col. 7, lines 20-25), which ultimately promotes the same amount of phase modulation (col. 2, lines 47-50).

9. Regarding claim 3 and 34, Roberts discloses the modulation method as recited above where the polarized signals are controllably attenuated (fig. 6, ref. 170).

10. As to claim 4, Roberts discloses the modulation method as recited above but also teaches that the delay results from propagation lengths that are different for each of the first and second polarized optical signals (fig. 3, ref. 64, 66).

11. Regarding claim 5, Roberts discloses the modulation method as recited above, however, the reference fails to specifically disclose a delay resulting from two planes of birefringent medium, characterized by a first and second propagation velocity of light.

Cao discloses Lithium Niobate crystals to serve as the birefringent medium that result in phase distortion and delay (col. 7, lines 20-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned planes of birefringent media, characterized by a first and second propagation velocity of light since one would be motivated by its high electro-optic coefficient (col. 1, lines 24-29), which is vital for use in communication applications, such as in all-optical regenerators for enhancing speed and long haul transmission (col. 1, lines 16-20).

12. As per claim 6, Roberts discloses the modulation method as recited above that includes rotation in the combining step of the first or second polarization states (fig. 3, ref. 46; fig. 12, ref. 200).

13. Regarding claims 7-8, Roberts the modulation method as recited above, however, the reference fails to specifically teach that the optical clock has a clock rate that is substantially equal to and more than twice the clock rate of the input optical clock signal.

It would have been obvious to one of ordinary skill in the art at the time the invention to have taught that the optical clock has a clock rate that is substantially equal to and more than twice the clock rate of the input optical clock signal since Roberts alludes to it when the reference teaches up-conversion to the full line rate for use in regenerators, for example, making it more attractive than all-optical solutions because it

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is less costly and less complex (col. 2, lines 7-10). Furthermore, Cao supports this by teaching concurrent with higher rate are polarization independence, low insertion loss, low driving voltages, good reliability, and ease of manufacture (col. 10, lines 21-26).

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 703-305-7242. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

gw
February 13, 2003

